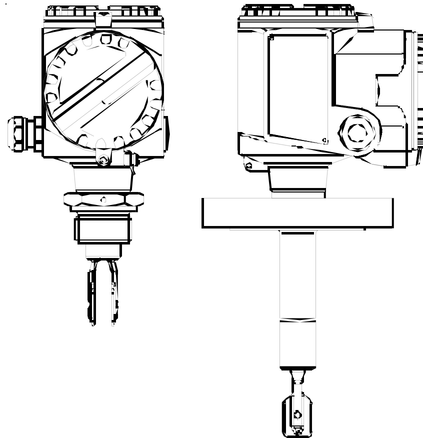
KA 163F/00/a6
52007095

音叉式液体限位开关

Liquiphant M
FTL 50-########7#,
FTL 51-########7#



Online now

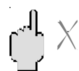
Endress+Hauser
People for Process Automation

首页 内容 打印 退出

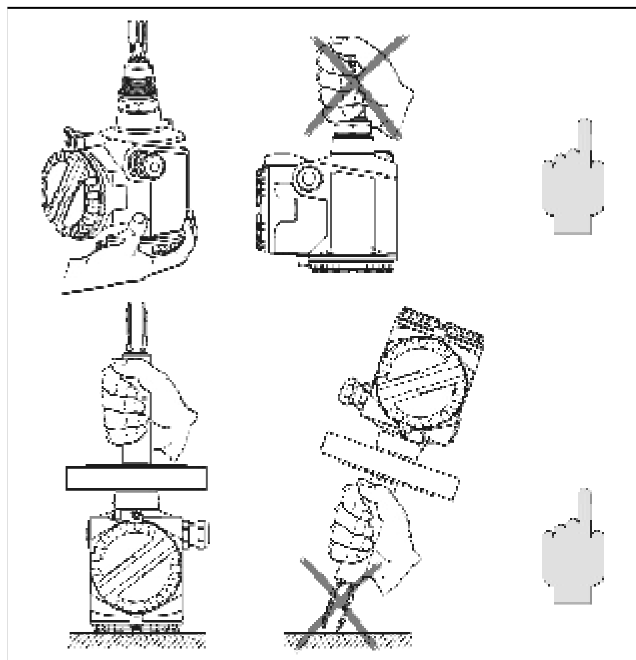
内容

安全注意事情

Liquiphant M FTL50,51用于液体限位检测。如果使用不当，可能引起应用方面的危险，FTL50，51必须由具有资格认证的专业人员在操作指南、相关标准、法律要求，有关证书的严格规定下进行安装、接线、调试、操作和维护。在仪表附近安装一个易操作的电源开关，并加以标注。

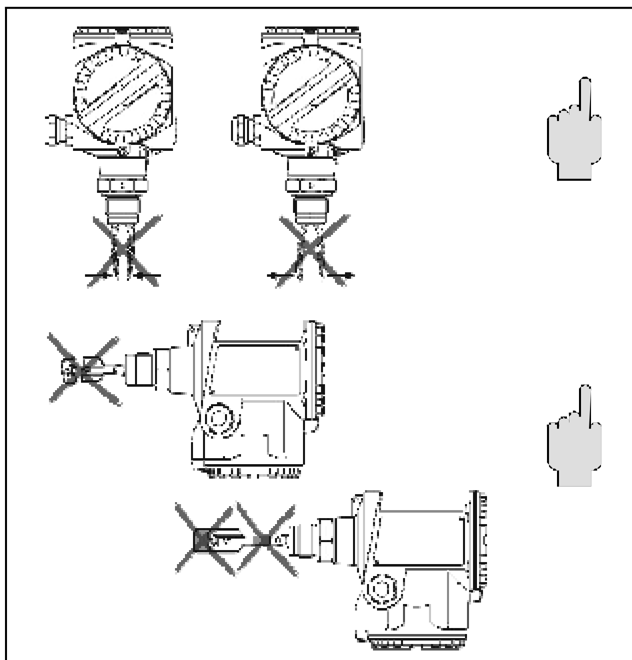


注意!
=禁止，错误操作

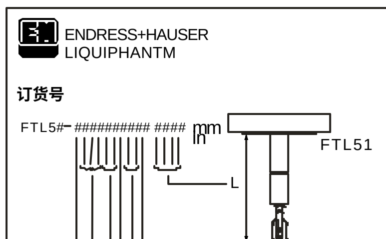


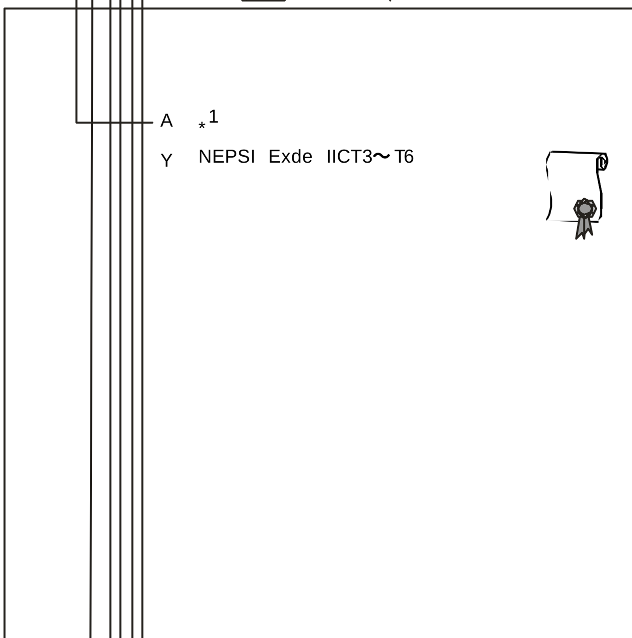
搬运
握住外壳、法兰或延长管

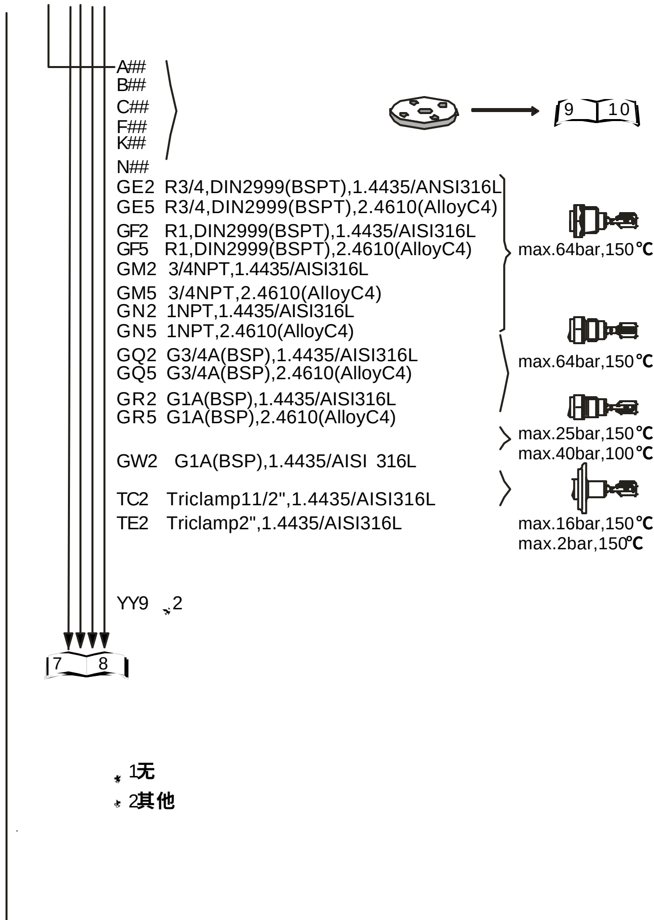
不能弯曲
不能截短
不能拉长



仪表型号


ENDRESS+HAUSER
LIQUIPHANTM
订货号
FTL5#- ########## #### mm
in
FTL51
L

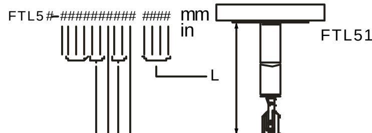

A *1
Y NEPSI Exde IICT3～T6

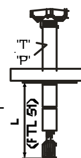

A##
B##
C##
F##
K##
N##
9 10
GE2 R3/4,DIN2999(BSPT),1.4435/ANSI316L
GE5 R3/4,DIN2999(BSPT),2.4610(AlloyC4)
GF2 R1,DIN2999(BSPT),1.4435/AISI316L
GF5 R1,DIN2999(BSPT),2.4610(AlloyC4)
GM2 3/4NPT,1.4435/AISI316L
GM5 3/4NPT,2.4610(AlloyC4)
GN2 1NPT,1.4435/AISI316L
GN5 1NPT,2.4610(AlloyC4)
max.64bar,150℃
GQ2 G3/4A(BSP),1.4435/AISI316L
GQ5 G3/4A(BSP),2.4610(AlloyC4)
GR2 G1A(BSP),1.4435/AISI316L
GR5 G1A(BSP),2.4610(AlloyC4)
max.64bar,150℃
GW2 G1A(BSP),1.4435/AISI 316L
max.25bar,150℃
max.40bar,100℃
TC2 Triclamp11/2",1.4435/AISI316L
TE2 Triclamp2",1.4435/AISI316L
max.16bar,150℃
max.2bar,150℃
YY9 *2
7 8
*1无
*2其他



ENDRESS+HAUSER
LIQUIPHANTM

订货号





AA *1(FTL50)
BB ......mm(148mm...3000mm),1.4435/AISI 316L
BE ......mm(148mm...3000mm),2.4610(AlloyC4)
CB ......in(6in...115in),AISI316L
CE ......in(6in...115in),2.4610(AlloyC4)
DB "LII",1.4435/AISI316L
DE "LII",2.4610(AlloyC4)

IA *1(FTL50)+"T"
JB ......mm(148mm...3000mm),1.4435/AISI316L+"T"
JE ......mm(148mm...3000mm),2.4610(Alloy C4)+"T"
KB ......in(6in...115in),AISI316L+"T"
KE ......in(6in...115in),2.4610(AlloyC4)+"T"
LB "LII",1.4435/AISI316L+"T"
LE "LII",2.4610(AlloyC4)+"T"

QA *1(FTL50)+"P"
RB ......mm(148mm...3000mm),1.4435/AI SI316L+"P"
RE ......mm(148mm...3000mm),2.4610(AlloyC4)+"P"
SB ......in(6in...115in),AISI316L+"P"
SE ......in(6in...115in),2.4610(AlloyC4)+"P"
TB "LII",1.4435/AISI316L+"P"
TE "LII",2.4610(AlloyC4)+"P"

YY *2

A FEL50A,PROFIBUS-PA
1 FEL51,U〜:19...253V
2 FEL52,U=:10...55VPNP-Transistor — 2
4 FEL54,U〜:19...253V,U=:19...55V
5 FEL55,11...36V,8/16mA,EExia
6 FEL56,NAMUR(EN50227),L-H,EExia
7 FEL57,PFM,EExia
8 FEL58,NAMUR(EN50227),H-L,EExia
9 *2

32...39

Alu/sep.

E 7 Alu/sep.,Nema4x,3/4NPT
F7 Alu/sep.,IP66/67,G1/2
G 7 Alu/sep.,IP66/67,M20×1.5
Y 9 *2

#4
#5
#6

PBT Alu 1.4404

KA143

A **标准**
C 3.1B(EN10204)
S **(德国劳氏)船级认证**
Y *2

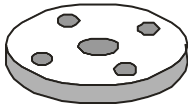
*1 **无**
*2 **其他**

"LII" **开 关 点**
LiquiphantIIFTL360/365,FDL30/35

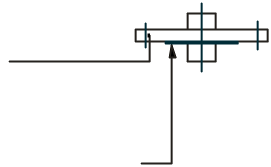
"T" **绝热管**

"P" **压力密封套管**

法兰



ANSIB16.5



A82 1", 150 psi,RF,AISI316L
AA2 1¼", 150 psi,RF,AISI316L
AB2 1¼", 150 psi,RF,AISI316L
AC2 1½", 150 psi,RF,AISI316L
AD2 1½", 300 psi,RF,AISI316L
AE2 2", 150 psi,RF,AISI316L
AE5 2", 150 psi,RF,AISI316L+2.4610(AlloyC 4)
AF2 2", 300 psi,RF,AISI316L
AG2 2", 600 psi,RF,AISI316L
AJ2 2½", 300 psi,RF,AISI316L
AL2 3", 150 psi,RF,AISI316L
AM2 3", 300 psi,RF,AISI316L
AP2 4", 150 psi,RF,AISI316L
AQ2 4", 300 psi,RF,AISI316L
AR2 4", 600 psi,RF,AISI316L

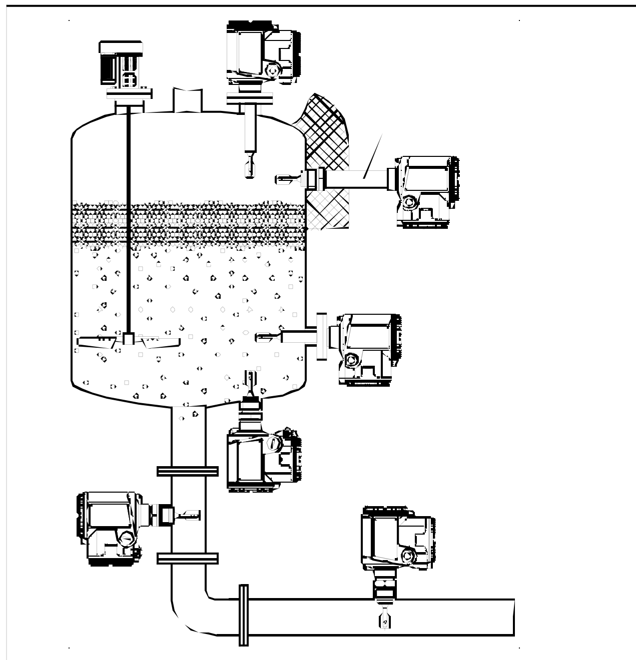
DIN

B82 DN25, PN40,DIN2527(B),1.4435/AISI316L
BA2 DN32, PN6, DIN2527(B),1.4435/AISI316L
BB2 DN32, PN40,DIN2527(B),1.4435/AISI316L
BC2 DN40,PN6,DIN2527(B),1.4435/AISI316L
BD2 DN40,PN40,DIN2527(B),1.4435/AISI316L
BE2 DN50, PN6, DIN2527(B),1.4435/AISI316L
BG2 DN50, PN40,DIN2527(B),1.4435/AISI316L
BH2 DN65,PN6,DIN2527(B),1.4435/AISI316L
BK2 DN65, PN40,DIN2527(B),1.4435/AISI316L
BM2 DN80,PN16,DIN2527(B),1.4435/AISI316L
BN2 DN80,PN40,DIN2527(B),1.4435/AISI316L
BQ2 DN100,PN16,DIN2527(B),1.4435/AISI316L
BR2 DN100,PN40,DIN2527(B),1.4435/AISI316L

C82 DN25 , PN40,DIN2526(C),1.4435/AISI316L
C85 DN25 , PN40,DIN2526(C),1.4435/AISI316L+2.4610(AlloyC4)
CA2 DN32 , PN6 , DIN2526(C),1.4435/AISI316L
CA5 DN32 , PN6 , DIN2526(C),1.4435/AISI316L+2.4610(AlloyC4)
CE2 DN50 , PN6 , DIN2526(C),1.4435/AISI316L
CE5 DN50 , PN6 , DIN2526(C),1.4435/AISI316L+2.4610(AlloyC4)
CG2 DN50, PN40,DIN2526(C),1.4435/AISI316L
CG5 DN50, PN40,DIN2526(C),1.4435/AISI316L+2.4610(AlloyC4)
CN2 DN80 , PN40,DIN2526(C),1.4435/AISI316L
CN5 DN80 , PN40,DIN2526(C),1.4435/AISI316L+2.4610(AlloyC4)
CQ5 DN100,PN16,DIN2526(C),1.4435/AISI316L
CQ5 DN100,PN16,DIN2526(C),1.4435/AISI316L+2 .4610(AlloyC4)
FG2 DN50 , PN40,DIN2512(F),1.4435/AISI316L
NG2 DN50, PN40,DIN2512(N),1.4435/AISI316L

JISB2210

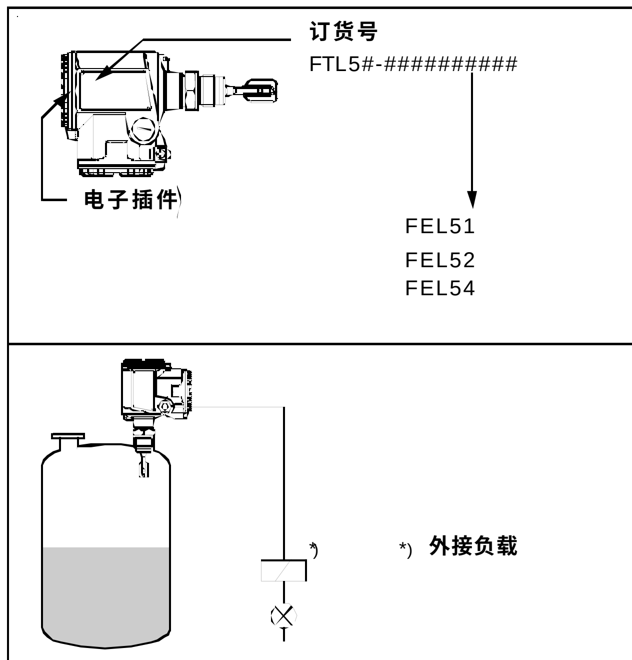
KE2 JIS,RF10K50,1.4435/AISI 316L
KE5 JIS,RF10K50,1.4435/AISI L+2.4610(AlloyC4)



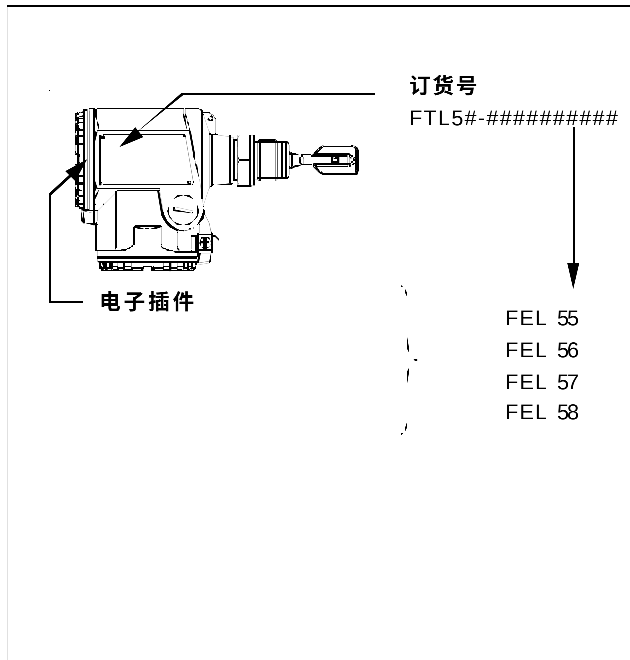
应用

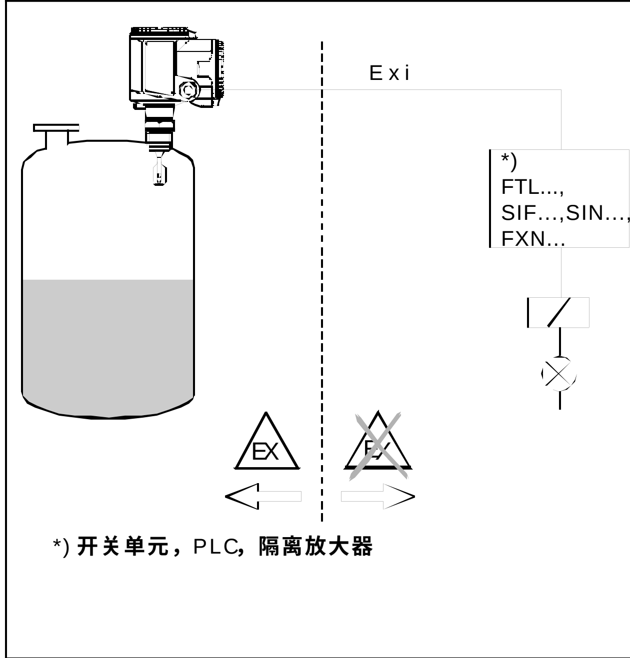
液体限位检测

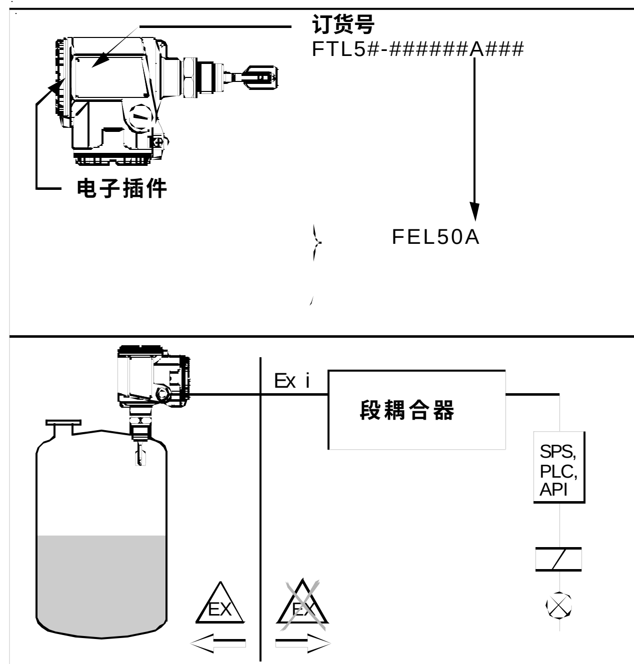
测量系统
直接连接



测量系统
通过开关单元连接



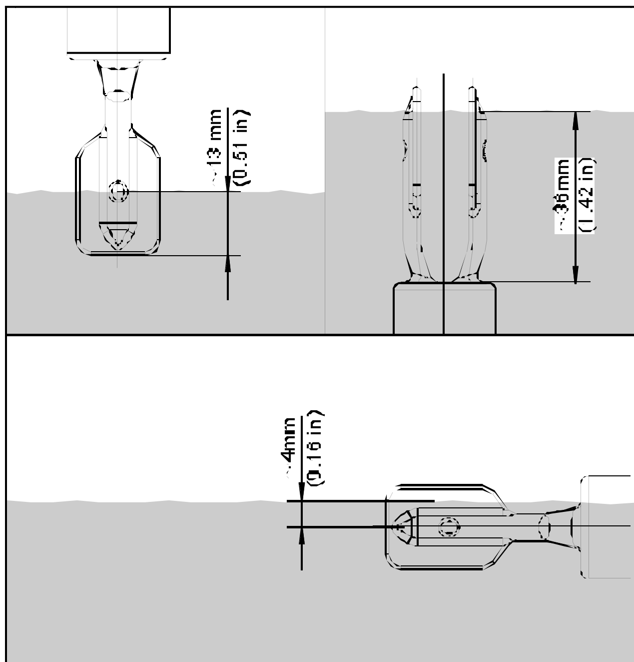

Exi
*)
FTL...,
SIF...,SIN...,
FXN...
EX
EX
*) 开关单元，PLC，隔离放大器



测量系统

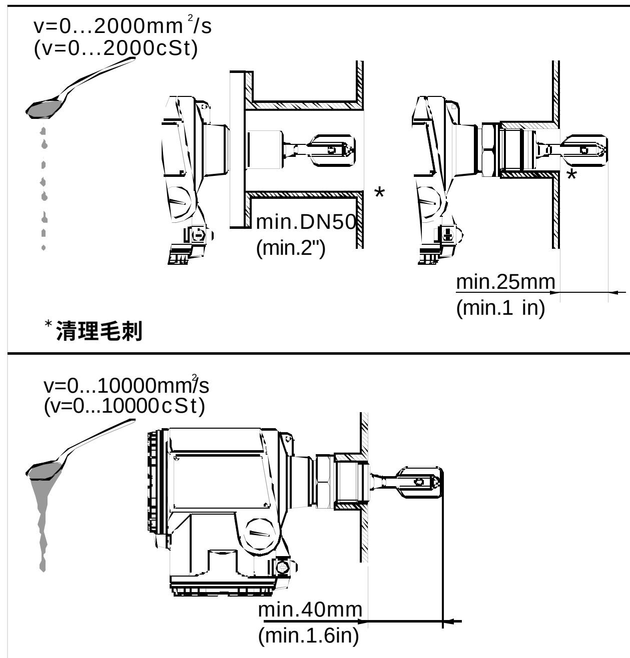
连接至PROFIBUS-PA

安装

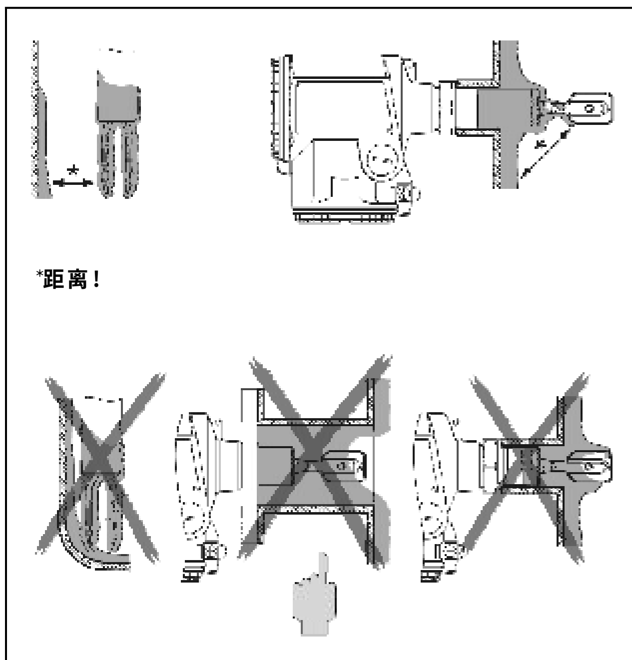


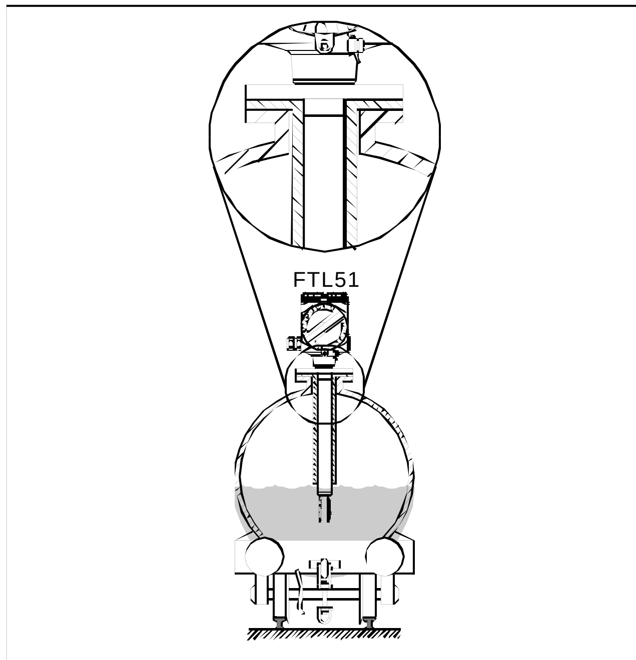
开关点取决于安装位置

液体粘度为 γ 的安装示例



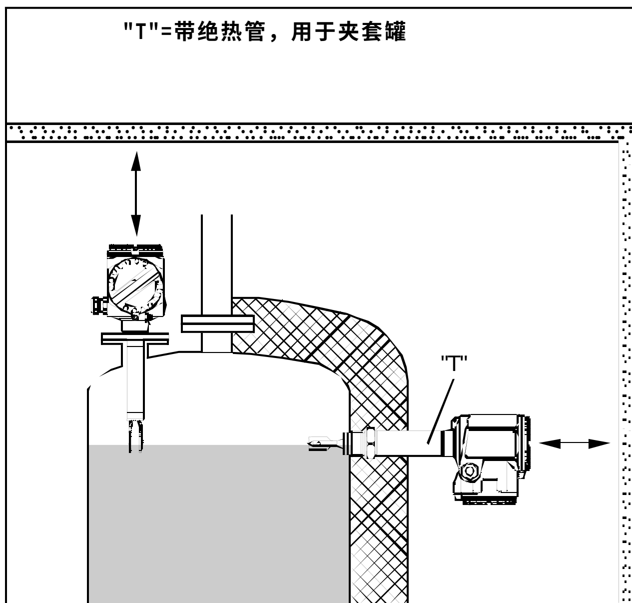
注意粘结的影响
叉体不能接触粘结

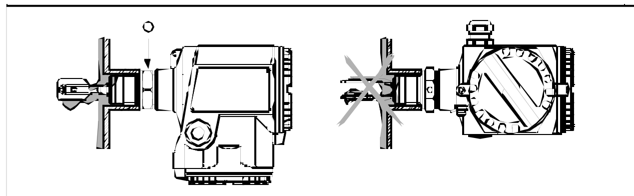


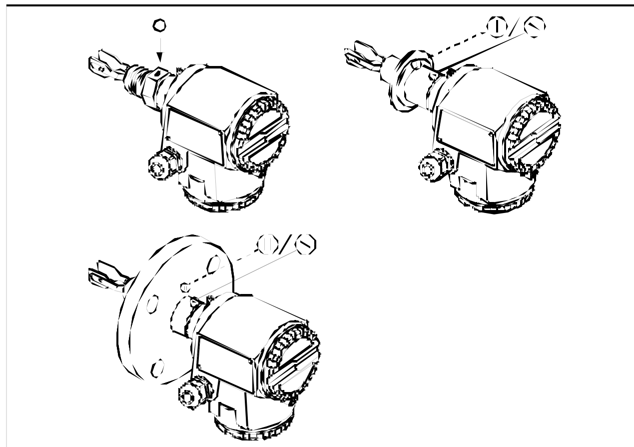


存在剧烈的外力作用的场合下，安装时应采取加固保护措施

允许间距

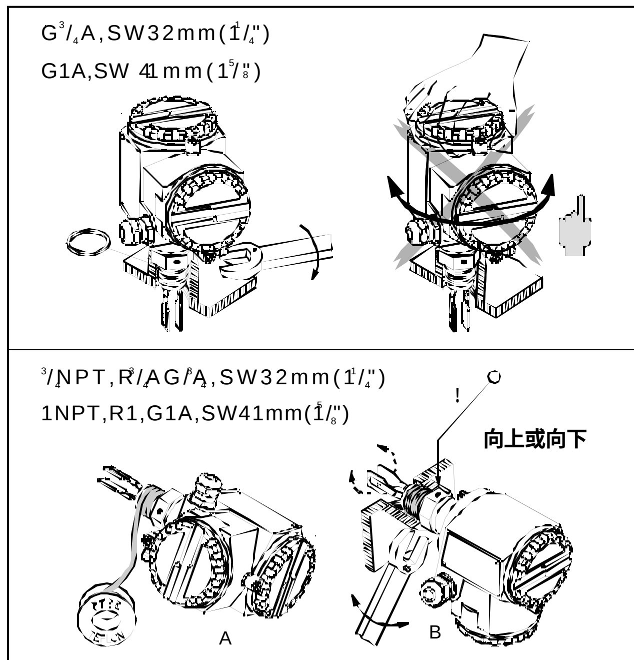


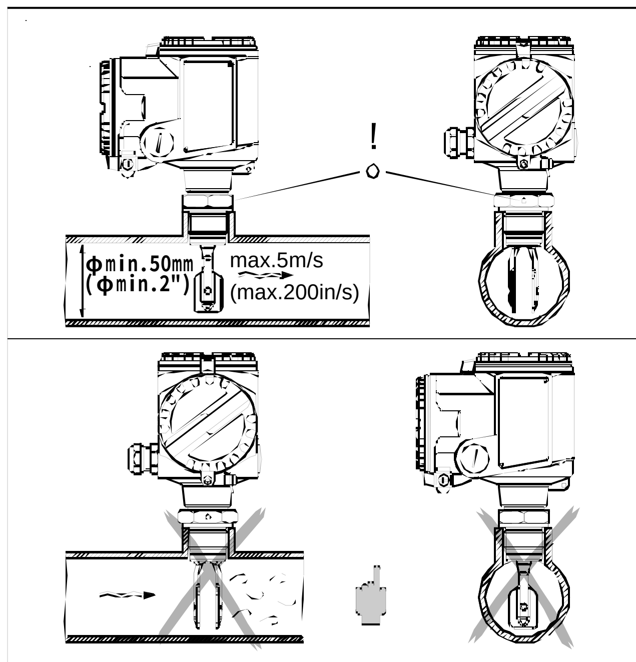




叉齿定位时请注意：
标识向下或向上

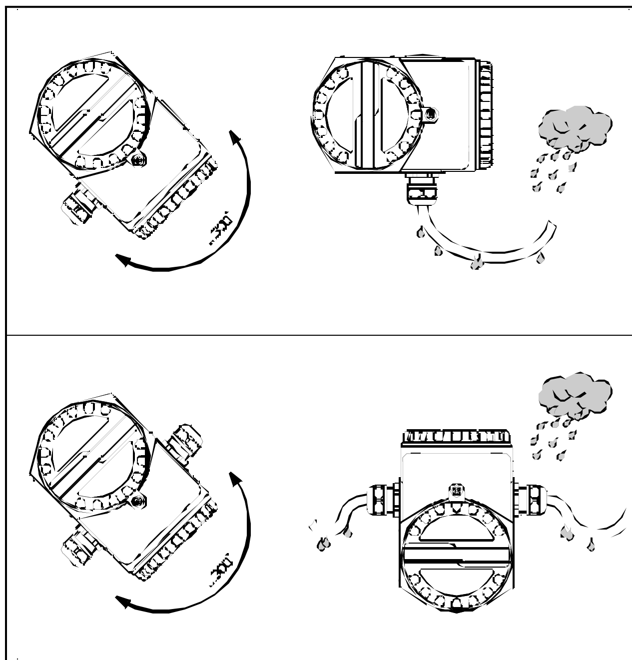
Liquiphant M仪表与过程连接件连接时，不得旋转壳体。

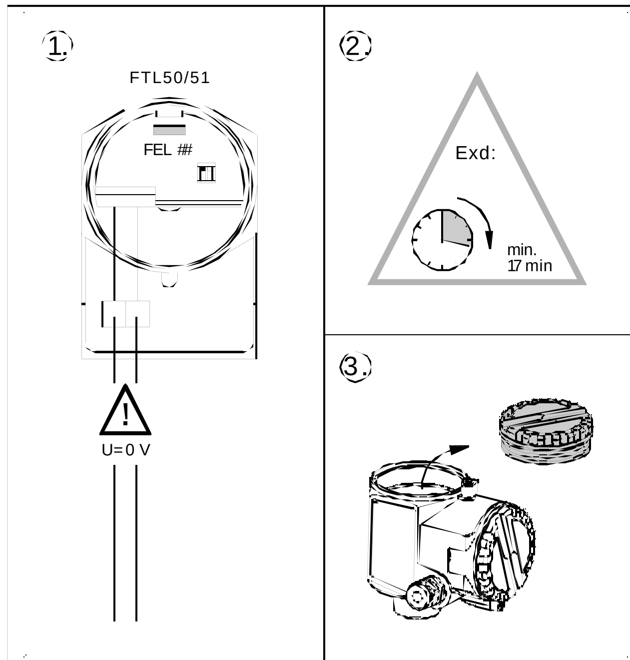




在管道中的安装方位：
标识与流向一致

缆塞方位

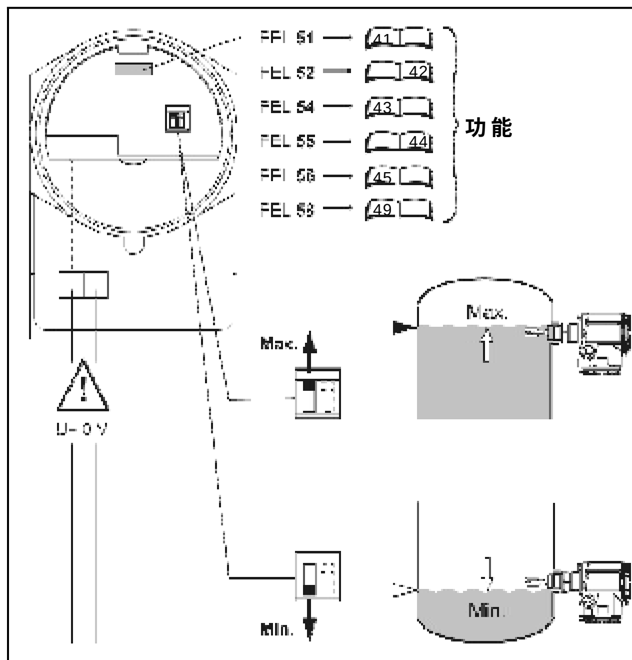




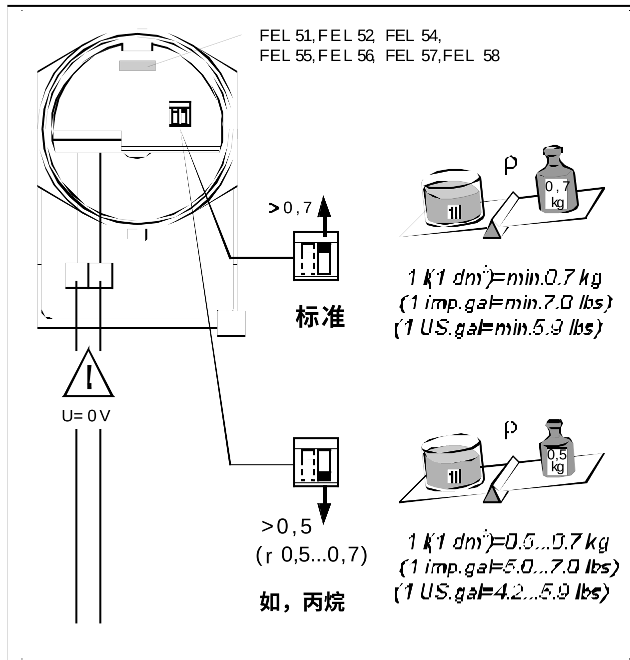
设定

打开电子腔室

最小/最大
故障安全模式



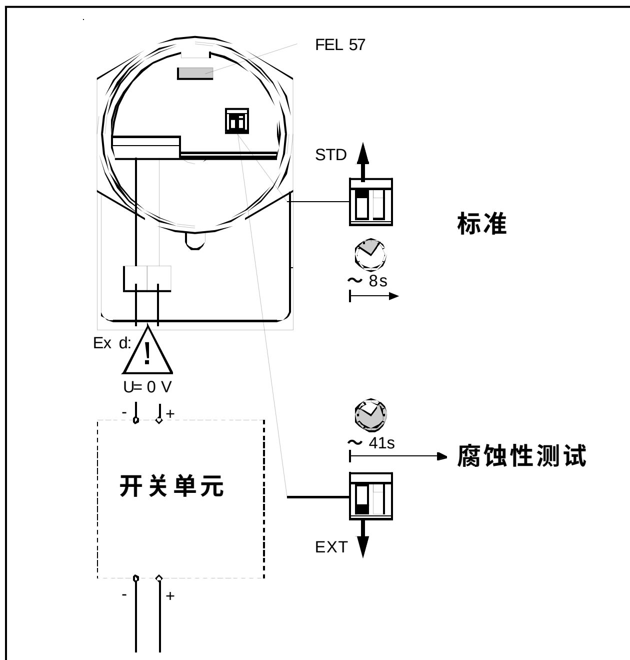
FEL 51
FEL 52
FEL 54
FEL 55
FEL 56
FEL 58
41
42
43
44
45
49
功 能
Max.
Max.
Min.
Min.
U = 0 V

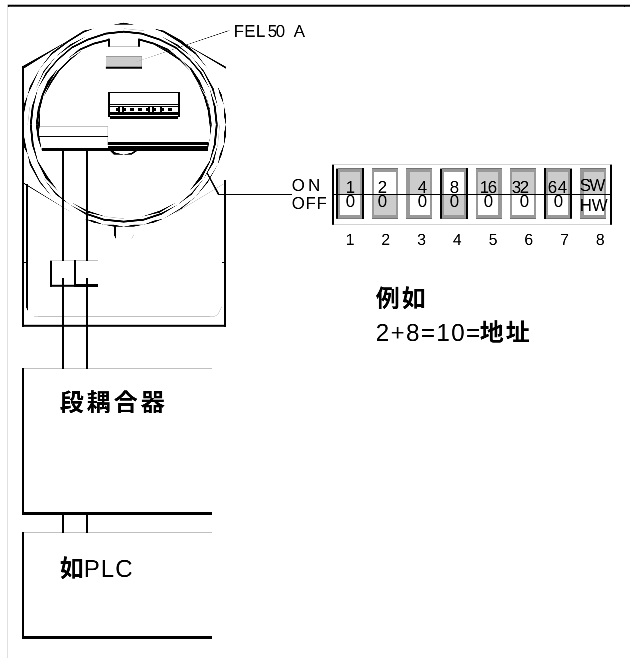


液体密度

密度ρ g/cm³或kg/l

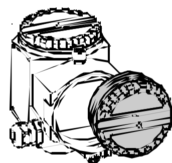
FEL 57
功能测试
上电自检状态
(见P47,48和开关单元)

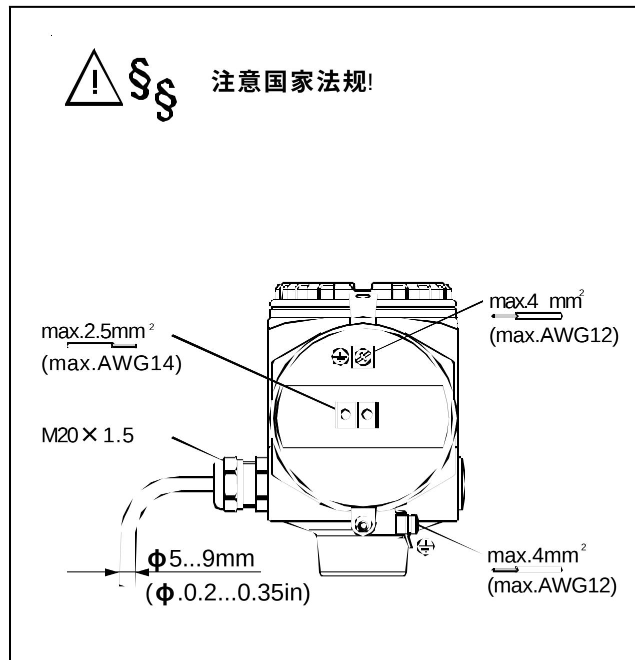




设定地址
(设定参数,见BA141F)

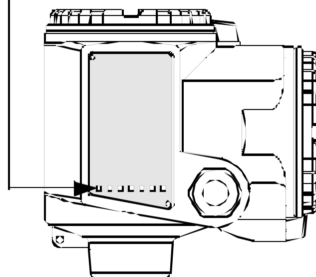
电气连接



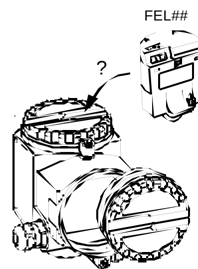

注意国家法规!
max.2.5mm²
(max.AWG14)
max.4 mm²
(max.AWG12)
M20×1.5
ϕ5...9mm
(ϕ.0.2...0.35in)
max.4mm²
(max.AWG12)

见铭牌

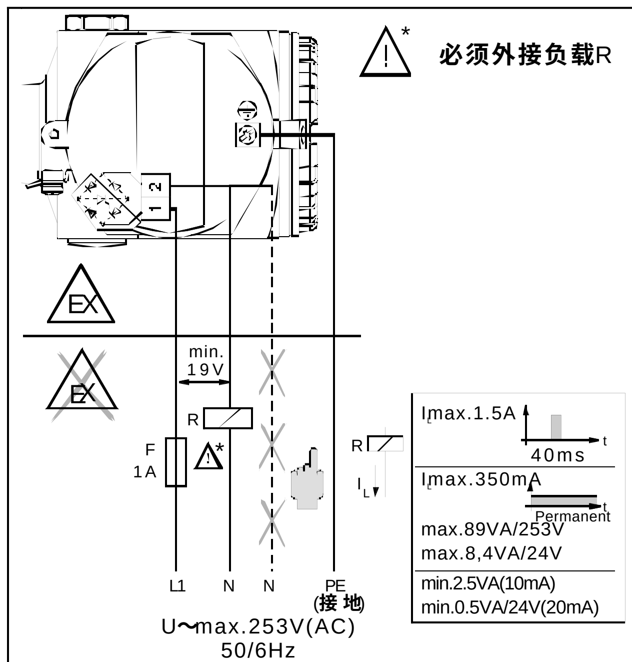
FEL##
FEL##
FEL##
FEL##
FEL##
FEL##



一体化电子插件



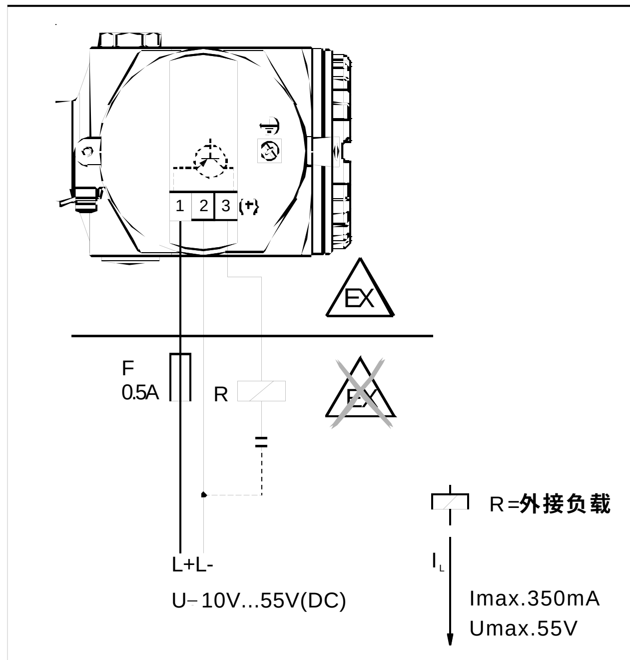
FEL51接线
二线制AC



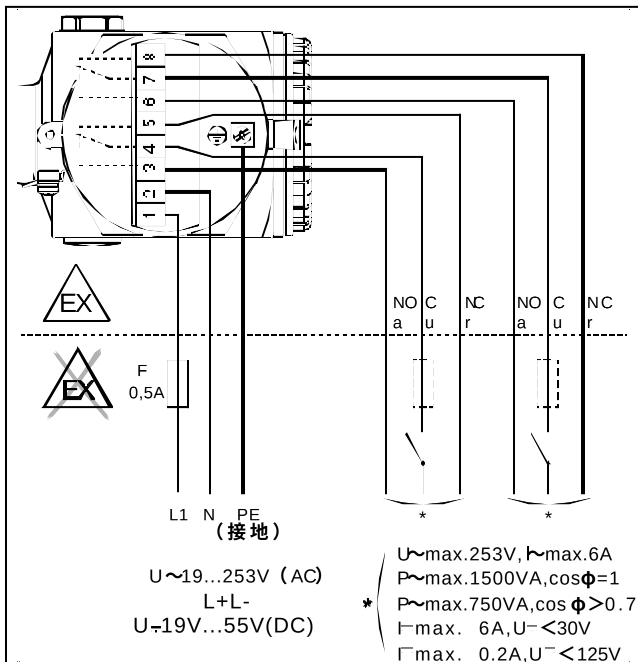
毁坏



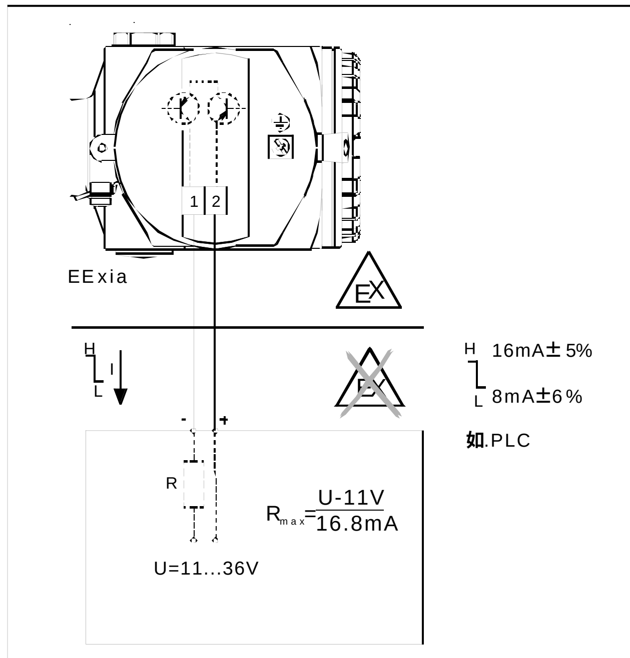
FEL 52 接线
DC(PNP)



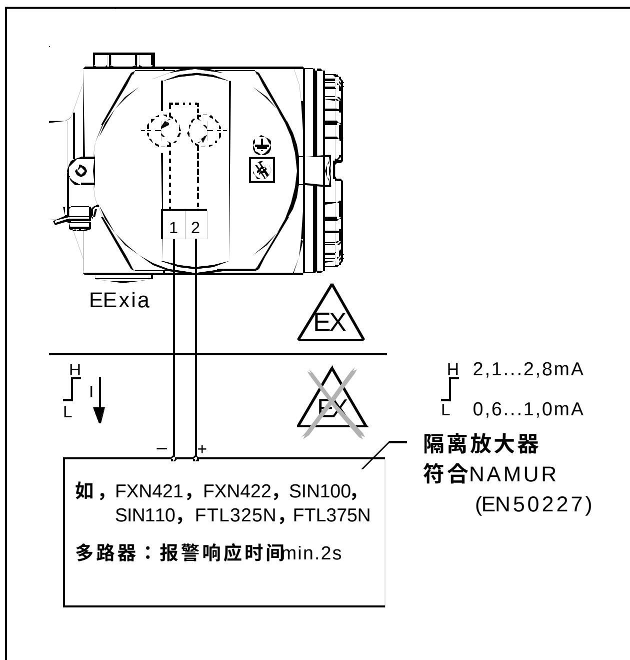
FEL54接线
通用型
继电器输出



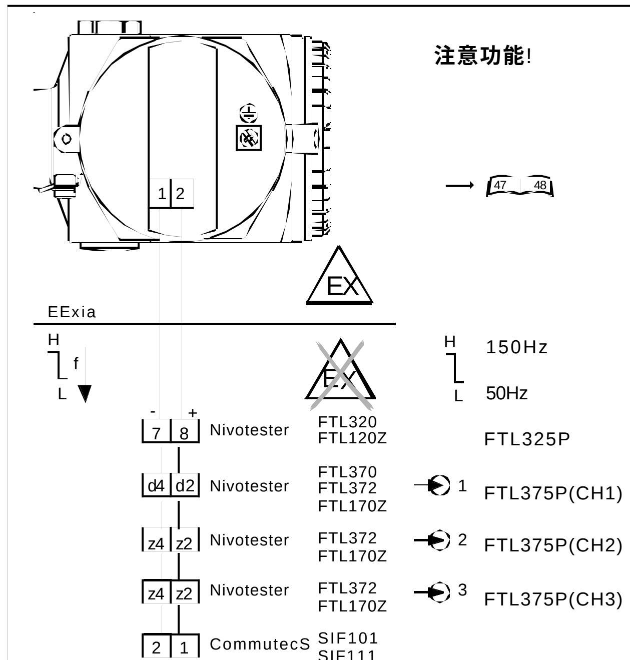
FEL 55接线
输出
16/8mA



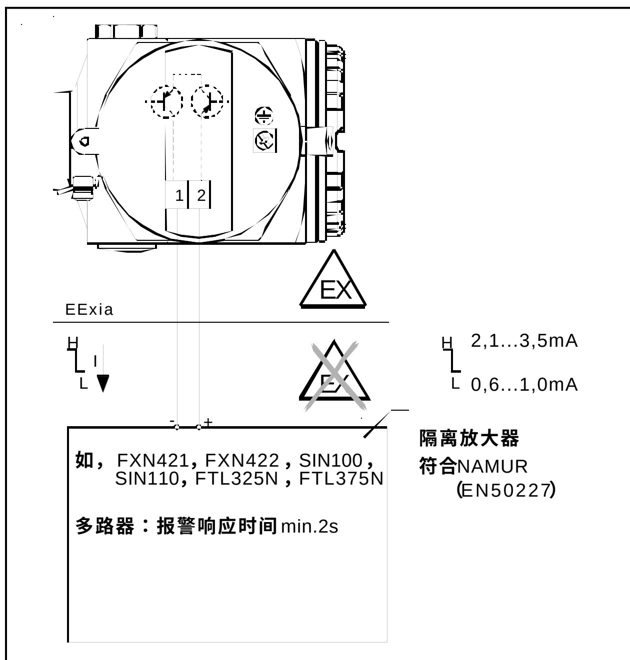
FEL 56接线
NAMUR输出L-H
<1.0mA/>2.1mA



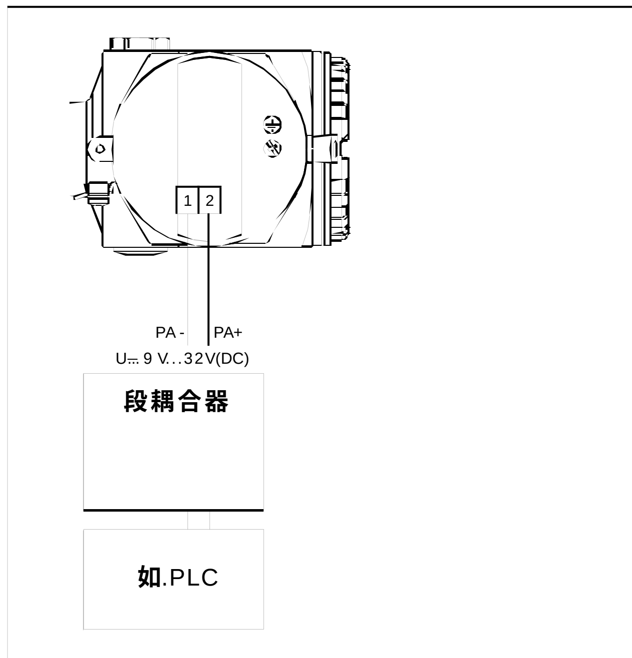
FEL57接线
PFM输出
150Hz/50Hz



FEL58接线
NAMUR输出H-L
＞2.1mA/＜1.0mA

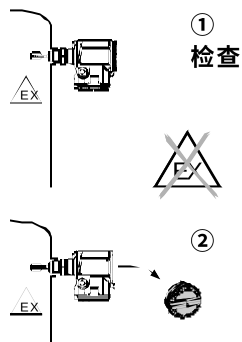


FEL50A接线

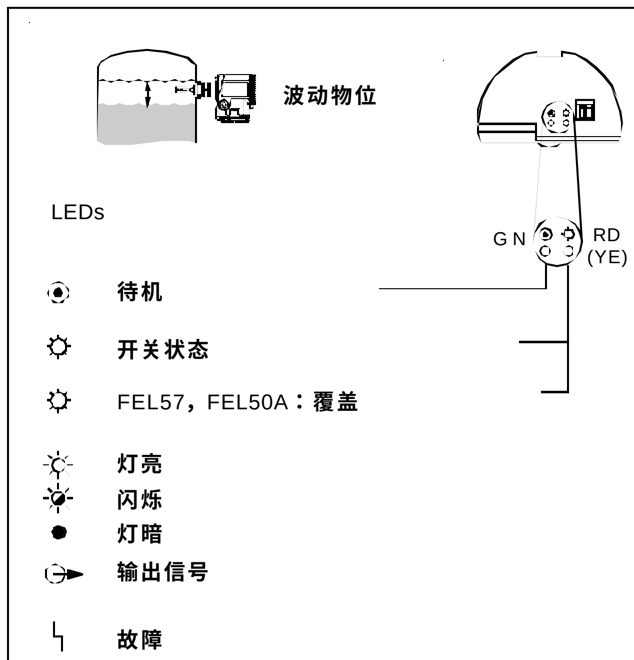


功能

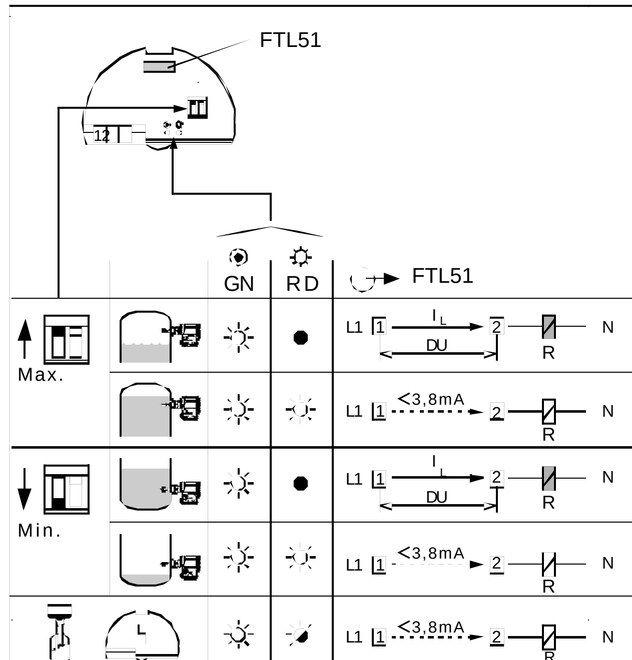
Exd:



EX
①
检查
EX
②
EX

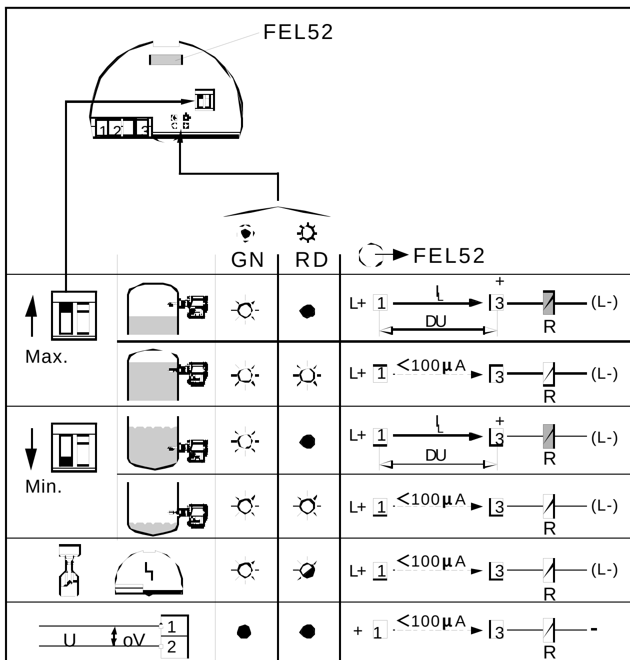


波动物位
LEDs
GN
RD
(YE)
待机
开关状态
FEL57，FEL50A：覆盖
灯亮
闪烁
灯暗
输出信号
故障



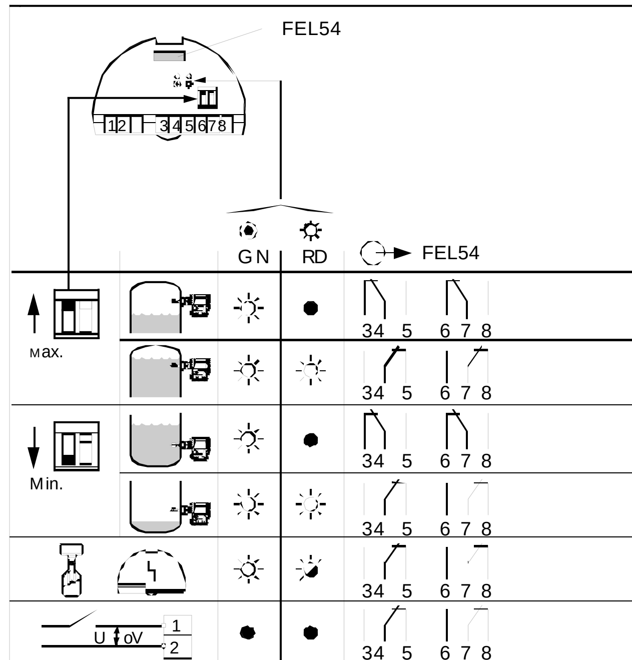
FTL51 功能

FEL 52功能

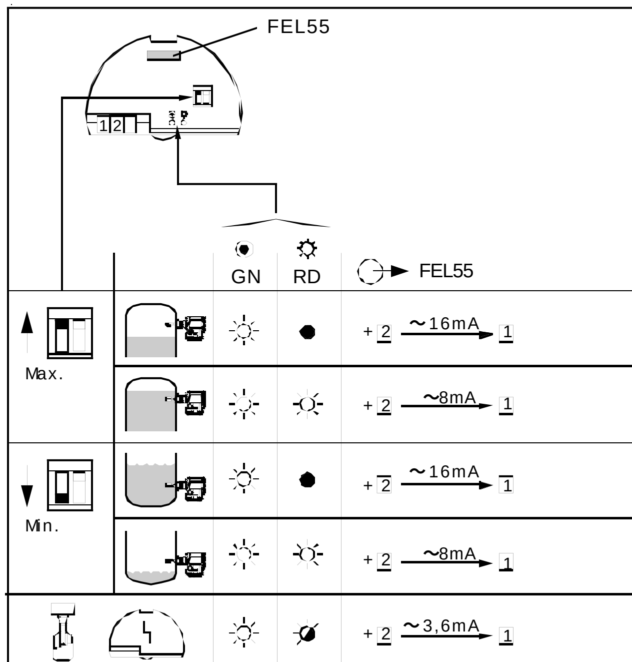


ΔU_{FEL52} =max.3V

FEL54功能

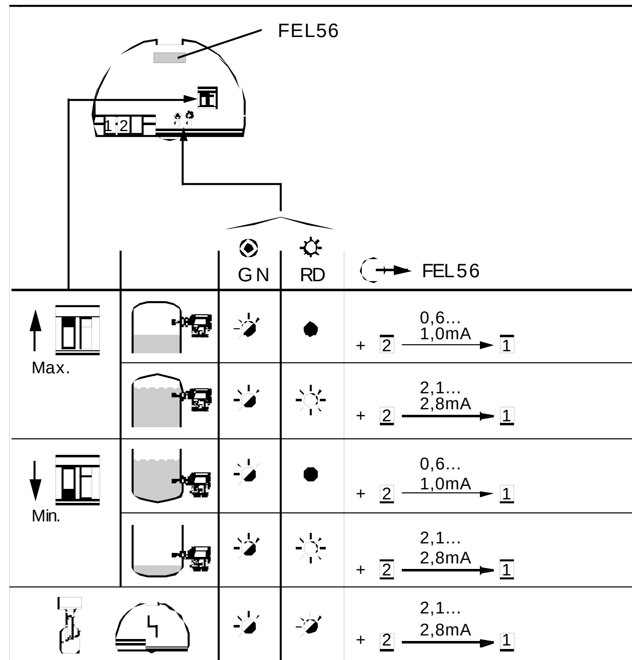


FEL55功能



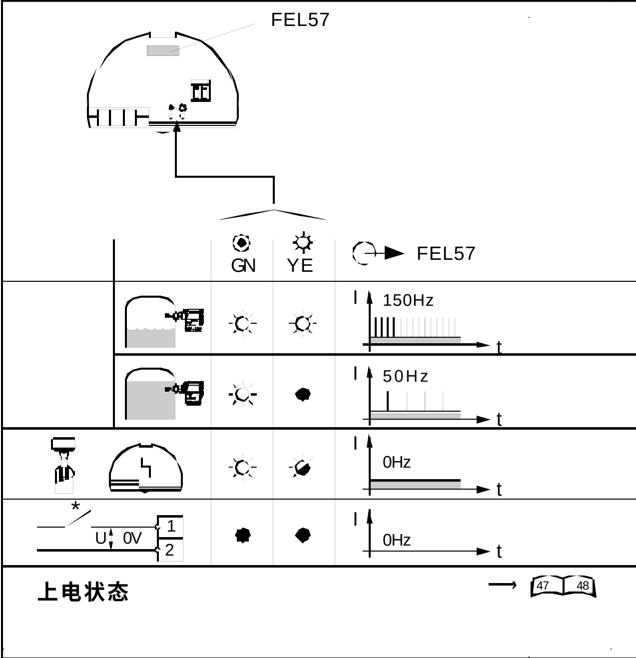
FEL55
1 2
GN
RD
FEL55
Max.
+ 2 ~16mA 1
+ 2 ~8mA 1
Min.
+ 2 ~16mA 1
+ 2 ~8mA 1
+ 2 ~3,6mA 1

FEL56功能

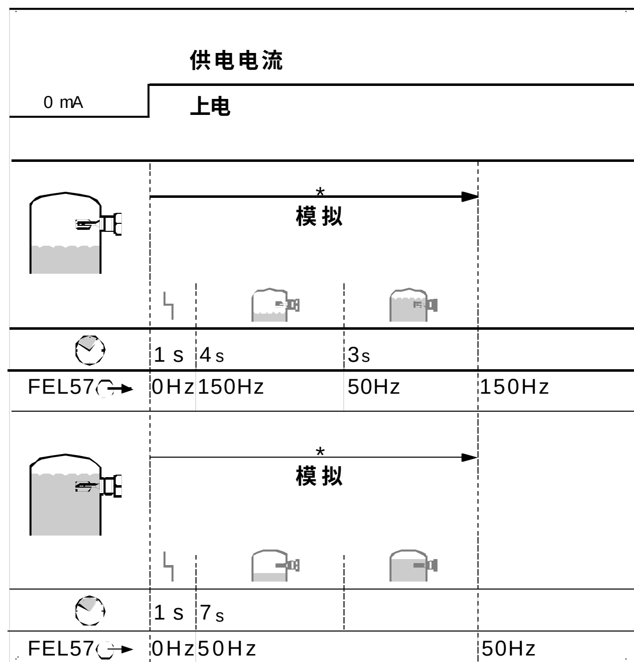


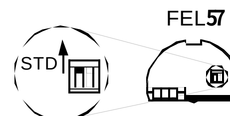
FEL56
1 2
GN
RD
FEL56
Max.
Min.
0,6...
1,0mA
+ 2 1
2,1...
2,8mA
+ 2 1
0,6...
1,0mA
+ 2 1
2,1...
2,8mA
+ 2 1
2,1...
2,8mA
+ 2 1

FEL57功能



FEL57功能
上电自检模式STD
（自检状态*）





FEL57功能
上电自检模式EXT
（自检状态*）

供电电流

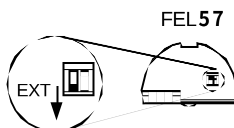
0mA 上电

*
模拟

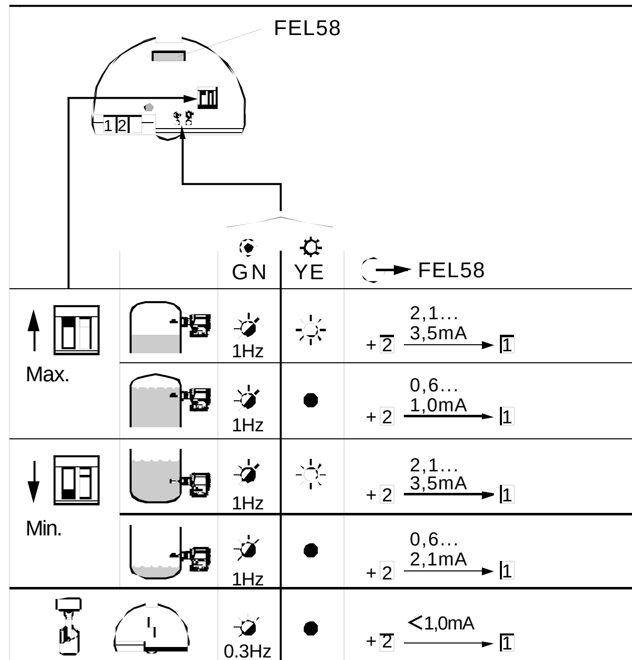
	1 s	4 s	30s	6s	
FEL57	0Hz	150Hz	50Hz	0 Hz	150Hz

*
模拟

	1 s	34 s		6s	
FEL57	0Hz	50Hz		0Hz	50Hz

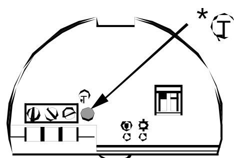


FEL58功能


FEL58
1 2
GN
YE
FEL58
Max.
1Hz
+ 2
2,1…
3,5mA
1
1Hz
+ 2
0,6…
1,0mA
1
Min.
1Hz
+ 2
2,1…
3,5mA
1
1Hz
+ 2
0,6…
2,1mA
1
0.3Hz
+ 2
<1,0mA
1

FEL58自检按钮

正常操作		自检按钮 ⓣ		操作
Max / Min	GN YE - + 1 2 3	① min. 3 s	②	~ 2 s later
↑ Max.	GN YE 1Hz	GN YE		GN YE 1Hz
↓ Min.	+2 2,1… 3,5mA → 1	+2 0mA → 1		+2 2,1… 3,5mA → 1
↑ Max.	GN YE 1Hz	GN YE		GN YE 1Hz
↓ Min.	+2 0,6… 1,0mA → 1	+2 0mA → 1		+2 0,6… 1,0mA → 1

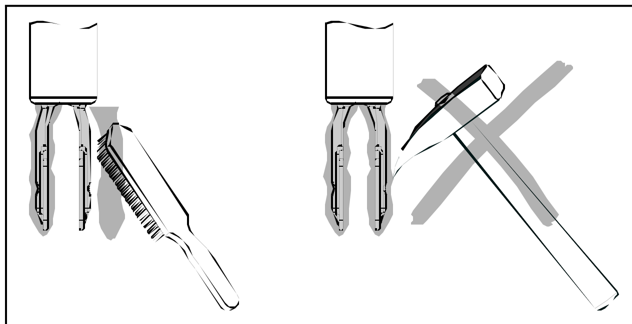


FEL50A 功能

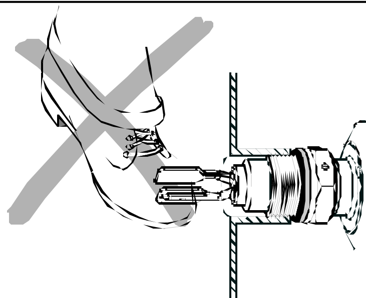
FEL50A		GN	YE	FEL50A PA总线信号
不转换		亮	●	OUT_D = 0
		亮	亮	OUT_D = 1
转换		亮	亮	OUT_D = 0
		亮	●	OUT_D = 1
SPS Commuwin II		闪	–	通信
		–	闪	状态，见BA141F
u 0 V 1 2		●	●	../..

维护

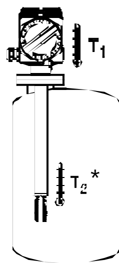
使用合适的刷子轻轻刷去叉齿表面的粘结物，严禁使用锤子等工具。

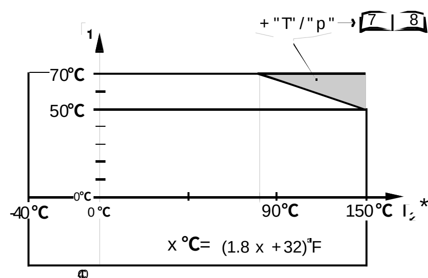


不要用脚踩踏



技术参数
环境温度T1
过程温度T2





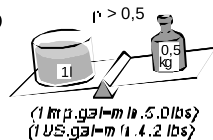
过程压力

* pe
* T2

过程连接附件

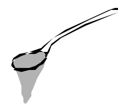
ρ_e=max.64bar(930psi)*

密度 ρ



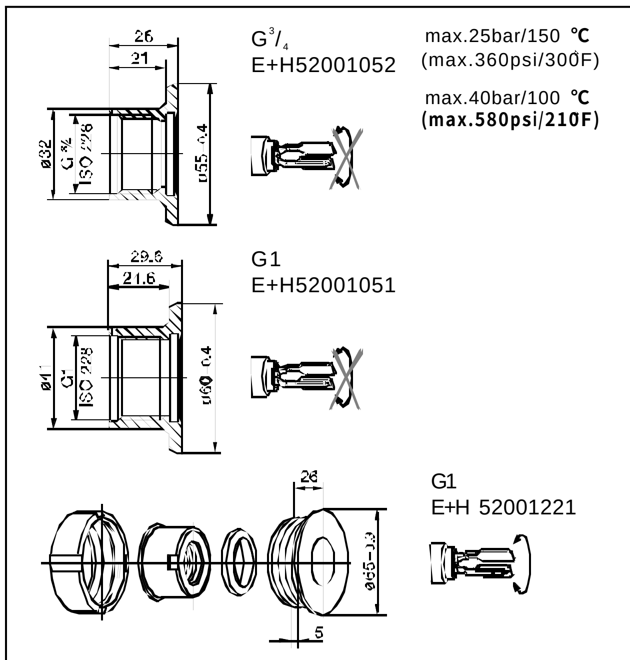
(1 Imp.gal=min.5.0lbs)
(1 US.gal=min.4.2 lbs)

粘度 ν



ν max. 10000 mm²/s
(ν max.10000cSt)

附件

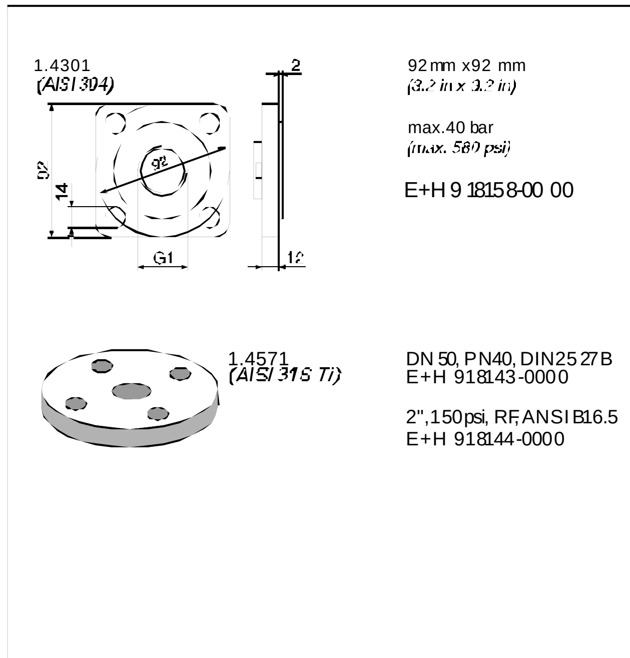


... mm

100 mm=3.94in

焊接座

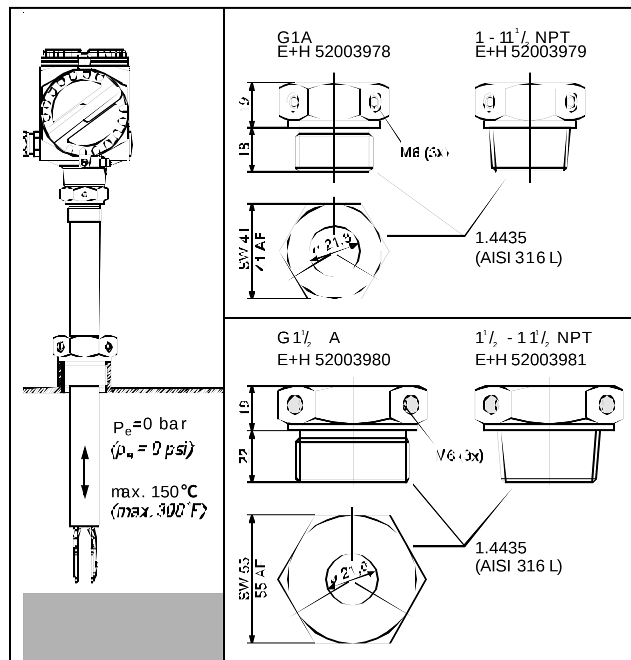
带BSP1(G1)螺纹的配套法兰

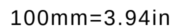




100mm=3.94in

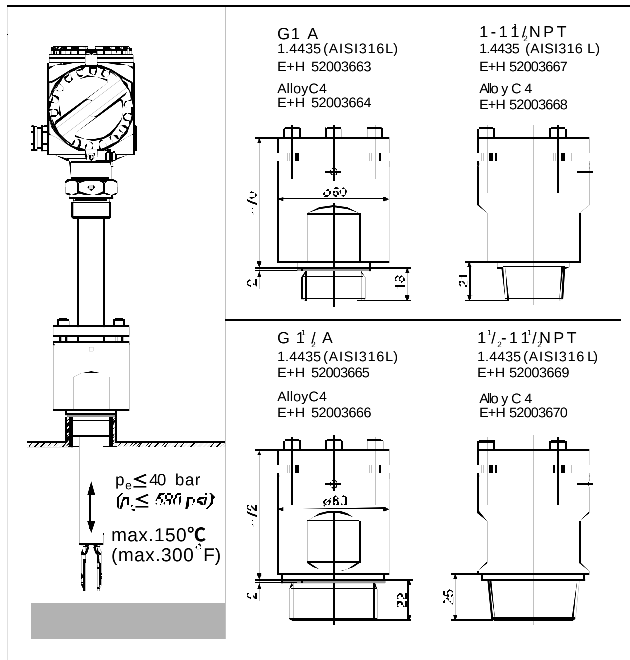
滑动套管用于不带压操作





100mm=3.94in

高压滑动套管



100mm=3.94in

故障诊断

故 障	原因	消除方法
开关不动作	无电源	检查电源
	信号线故障	检查信号线
	电子插件故障 －FEL51直接连至 L1和N	更换 -FEL 51通过外接负载连接
	液体密度太低	在电子插件上将密度设置 为＞0.5
	叉体有粘结	清洗叉体
	叉体被腐蚀 （FEL上显示：红灯/黄灯闪烁 FEL58：绿灯闪烁0.3Hz）	更换叉体和过程连接
	FEL51：继电器内部电阻太大	连接适当的继电器
	FEL51：继电器保持电流太低	在继电器上并联一个电阻
	FEL54：触点熔化（短路后）	更换FEL54，在触点回路中 加入熔断丝
开关误动作	最小/最大故障安全模式设置错误	在电子插件上设置正确 的模式
偶发性的开关故障	非常厚的泡沫 液面波动 带泡沫的液体	旁通管安装
	RFI严重	使用屏蔽电缆
	震动严重	减震、阻尼、将叉体旋转90°
	外壳进水	拧紧壳盖和缆塞
	FEL52：输出过载	减小负载，（电缆）电容
电源故障后开关误动作	FEL57 上电自检状态 （功能测试）	观察FEL57开关状态

故障诊断补充说明

如果叉体开关状态不正常，可在诊断插座上PIN4测出叉体频率。
对于电子插件FEL51，52，54，55，56，57，58，可通过正弦波振动确定叉体的状态。
对于FEL50A，通过矩形脉冲信号测定叉体频率。

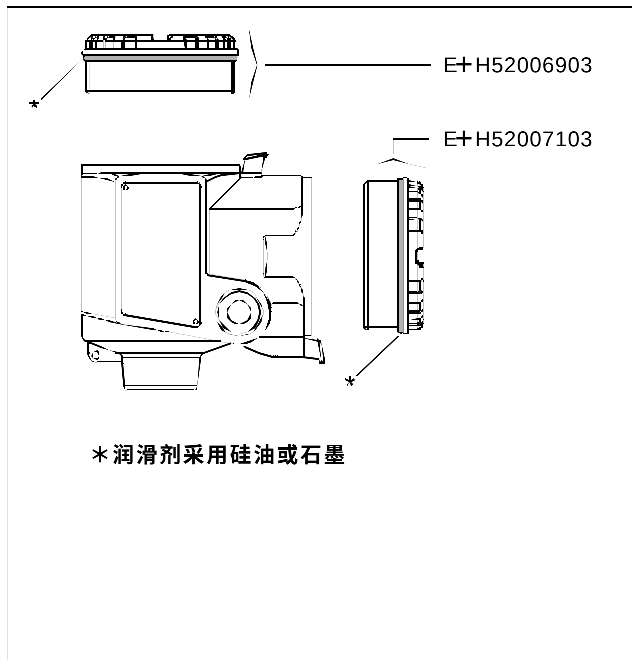
备件
电子插件

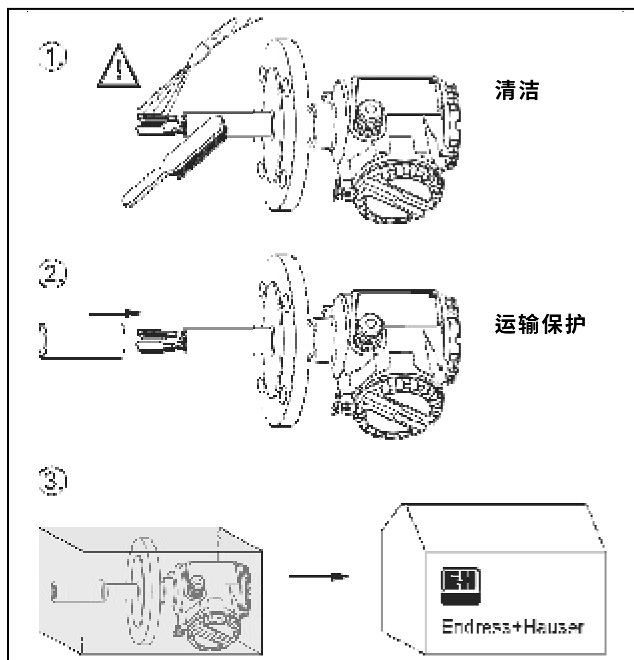


FEL51	E+H52002304
FEL52	E+H52002305
FEL54	E+H52002306
FEL55	E+H52002307
FEL56	E+H52002308
FEL57	E+H52002309
FEL58	E+H52006454
FEL50A	E+H52010527

安装说明：安装时，由非本安回路供电的电子插件不能连接在本安回路中。

外壳盖＋密封




1
清洁
2
运输保护
3
Endress+Hauser

相关资料

FTL50，50H，51，51H技术资料TI328F
FEL50A，PROFIBUS-PA操作手册 BA141F

安全注意事项

XA031F
CE Ex II1/2G,EExdIIC/B

XA063F
CE Ex II1/2G,EExia/ib IIC/B

XA064F
CE Ex II1G,EExia IIC/B

XA108F
CE Ex II1/2G,EExde IIC/B

XA154F
CE Ex II1/2G,EExia/ib IIC/B

XA159F
CE Ex II 1G,EExia IIC/B

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KA163F/00/a6/07.04